

# SUBTERRANEA BRITANNICA

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Bulletin compiled by Sylvia P. Beamon.

## EDITORIAL

This July is the twentieth anniversary of the founding of our French parent society Société Française d'Étude des Souterrains. This year's International Symposium is going to be held at AUNEAU near Chartres from 9th - 13th July. It would show our high regard to the society if as many members as possible of Subterranea Britannica could attend, although it is appreciated our summer holidays usually start later than the French. Don't delay, if you can come, book your accommodation NOW. (The programme including the list of Hotels was sent out with the Winter Conference notice.)

It is with regret that we have to announce the death of Mrs. Kay de Brisay, who died in September, and will be well remembered for her most interesting work on the winning and mining of salt.

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### ANNUAL GENERAL MEETING (CAMBS. & HERTS. BRANCH) - OCTOBER DAY CONFERENCE

Sylvia P. Beamon

The Secretary of the Federation, Mr. Paul Sowan, took the Chair for the Cambs. and Herts. Branch Annual General Meeting held at "Strathaird", Lucy Cavendish College, Cambridge on Saturday, 17th October, 1981. After the accounts and various reports had been received, a vote was taken and it was agreed that there should be an amalgamation of both the Federation and Cambs. and Herts. Branch Committees.

Mr. Tom Doig appealed for donations to continue the investigation of Anstey Castle mound project since the hiring of pumping equipment and petrol costs were proving expensive. (Ed. donations are still urgently needed).

The meeting continued with the following papers:

Bats - above and below ground. Mr. John Hooper proved to be a most entertaining and informative speaker. He explained that there were fifteen varieties of bats in England but the numbers were dropping. They were now protected by law, however, the word "take" in the legislation means that the bats should not even be taken off their roosts, looked at and put back. If disturbed when hibernating they usually fly around, which means they use up vital stored body fat.

The Dudley Canal tunnel (West Midlands) was the topic of the afternoon. Mr. Martin Guest gave an amusing account of the work of the Dudley Canal Trust which was formed in the early 1960's. The skill gained by the amateurs in their efforts to clear the waterways and the necessary restoration work by trial and error is remarkable. The dedication of this group has been rewarded by the fact that it is now possible for visitors to make trips into the canal tunnel.

Both talks were illustrated with excellent slides.

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### THE EAST SURREY STUDY WEEKEND, 26TH - 28TH JUNE, 1981.

Paul W. Sowan

Reactions to this year's Study Weekend varied from 'a most stimulating intellectual experience' to a complaint that it too closely resembled a 'cave-cum-pub crawl !' The Committee welcomes reaction of all sorts, especially adverse though preferably constructive, so that this increasingly popular event can be improved year by year. As anyone who undertakes the

organisation of such a weekend discovers, much hard work is involved in selecting sites, negotiating access, finding competent leaders and providing tackle for the less readily accessible ones, arranging insurance, arranging accommodation, and providing accurate background information on the district and the sites. It is all very well worthwhile - and even the local organisers tend to find out about, and visit, sites previously unknown to them !

East Surrey proved to have on offer a wide enough range of varied sites within a compact area to impress visitors from the northern counties ! Appropriately based at the Nutley Hall, a public house with its own sand-mine leading off the cellars (one of the sites visited), we commenced our programme proper on the Saturday morning exploring Reigate High Street and the Castle Mound. One moment over 40 people were congregating amongst the early shopping crowds at the High Street/Tunnel Road junction. The next, all had disappeared, via apparently Britain's earliest road tunnel (1823), into an extensive sand-mine made under the Castle mound, now converted into a rifle range. An examination of the few relics of the Castle, and its mound followed. This has an intriguing souterrain in its centre, the 'Barons' Cave', described by authors from Camden onwards. Properties abutting onto the southern and western slopes of the mound have had cellars, many of which have been extended into sand-mines of various sizes, plans and dates. A large irregular working on up to five levels was visited, from which 17th Century material has been obtained, although no proper excavation has yet been undertaken, and much damage has been done by bottle-hunters and others, as access is effectively unrestricted in this town-centre site. Other Reigate town centre sites included a Medieval undercroft, the nearby Nutley Hall mine, and an apparently much more recent and regularly made pair of coalesced sand mines at Reigate Lodge (now under the lawn of the VIth Form College.)

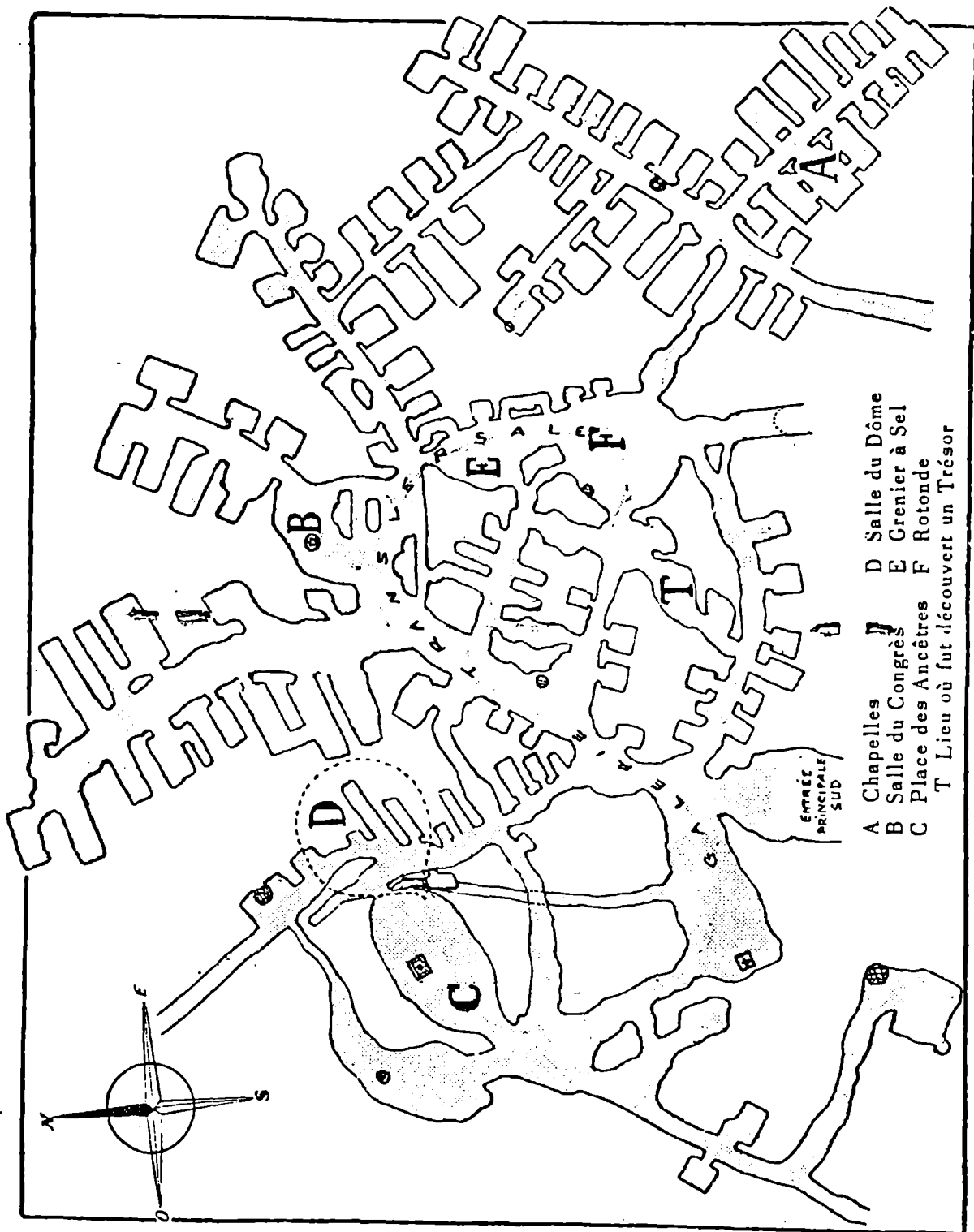
Military sites visited included the Deepdene wartime communications centre near Dorking, also excavated into the Folkestone Sand, and 'Monty's Hideout' in the face of a chalk pit overlooking Reigate. One further Folkestone Sand site was the wine-cellar/folly at South Street, Dorking.

The other main sites visited were in the calcareous sandstone Upper Greensand formation, where underground quarries for building stone have been worked since, perhaps, as early as late Saxon times. At the height of their importance in the Middle Ages, these quarries' output was almost exclusively destined for London and home counties major buildings, despite 20 miles (32.18 km.) or more land carriage to market over difficult ground. In this respect they resemble the Chilmark underground quarries in Wiltshire. Valued especially for internal carved work (freestone) and fine ashlar, and not suitable for external work, this stone was in direct competition with Caen stone from Lower Normandy. As, delivered on site in London and area, it was but marginally cheaper than Caen stone, and decidedly inferior, it is a puzzle why it was used at all. The quarries were worked for, largely, local purposes in the 18th and 19th Centuries, from which date the stone begins to appear in local vernacular architecture. Recent findings relating to the early 19th Century industrial site at the Merstham terminus of the Croydon, Merstham and Godstone Railway (a horse-drawn freight-only tramway) were explained above and below ground; it was here, and at no other mine site in Surrey, that the industrial revolution briefly impinged on the local stone industry - plateways, inclined planes, stationary winding engines, and a drainage sough were all tried out, but to disappointing effect. The poorness of the stone, geological and groundwater problems, and better canal and railway transport from superior quarries elsewhere all spelled the effective end of the freestone quarrying trade in Surrey. Ancient quarries at Chaldon, and 19th Century ones at Merstham and Godstone Hill, were all visited. At Godstone, too, the end of the story could be seen by those who negotiated the 75 ft. (22.8 m.) deep air-shaft to the Marden mine, which had been converted from building-stone working to hearthstone mining during its lifetime - probably in the later years of the 19th Century. But hearthstone, for whitening floors, hearths and doorsteps, was going out of use by the 1920's - the introduction of labour-saving houses with quarry tiles, and the difficulty in employing domestic, killed the trade.

Detailed excursion notes, incorporating references to the extensive published literature on the sites visited, were issued; copies, whilst stocks last, can be supplied to members wishing to have them, provided stamped self-addressed envelopes are sent for them.

THE UNDERGROUND CITY OF NAOURS (SOMME) FRANCE

Sketch plan showing the central area of the souterrain. (No scale present.)  
Taken from the official guide book La Cité Souterraine de Naours, (undated).



Bruce E. Osborne.

Naours is a long established agricultural hamlet in Picardy, situated 15 kms. from Doullens and 18 kms. from Amiens, and has the distinction of having a very extensive series of chalk caves which have been used for refuge over the centuries, during the skirmishes and wars that have raged over the region.

The caves are open to the public and one's first impression is of a rough hewn chalk mine with 2 m. high by 1 m. wide passages. The caves were probably dug originally for chalk for agriculture and extended either for further agricultural use or as refuges, or more likely a combination of both. There are some 9000 ft. (2.75 km. approx.) of passages on several levels. Each passage has numerous 'rooms' leading from it, thus making underground 'streets' in time of use as a refuge against external hostilities.

This souterrain of Naours almost certainly dates back to pre-Roman times and has numerous relics of occupation over the centuries. These relics include Roman coinage bearing the head of Faustine and fragments of large flanged tiles (1), shrines, memorials, plaques, graffiti etc. A more detailed history is given in the following account which is taken from an English translation of their published guide book La Cité Souterraine de Naours (Somme), Imp. Treilhou - Amiens.

On December, 15th 1887, the scholar Abbé Danicourt (1846-1912), who had only been appointed the year before as Curé of Naours, discovered the underground city and undertook its research. Helped by a good number of his parishioners, who over several winters provided him with untiring labour, he devoted himself during the long years to the exploration and repair of these immense underground caverns.

These caves constitute the most characteristic and complete type of refuge known to this day. This assertion has been made many times, amongst others by M. Alfred Martel, the well-known explorer, one of the most competent of judges in this field.

Entirely hollowed out by the hand of man at an average depth of 33 m. they are composed overall of about thirty galleries stretching to a total length of 2,000 m. The height of these galleries varies between 1.60 m. and 2 m. Three hundred chambers served as storage areas for the inhabitants, and also as temporary shelters for them, as well as their beasts, during the wars and invasions which ravaged their region so frequently.

It has been substantiated that the grottos began to be used for habitation during the period of the barbaric invasions of the 3rd and 4th Centuries A.D. and later in the 9th Century at the time of the Norman invasions. The varied inscriptions figuring on the walls as well as numerous objects and coinage discovered during the years which followed the re-opening of the souterrain testified to the periods it was occupied. The latter (coinage) coincides with the various invasions suffered by the region.

It was in the first years of the 6th Century that the Scandinavian pirates, "the Norsmen" began making their appearance on the coasts of Gaul. Beaten by Theodebert, son of King Theodoric in 515 A.D., after having laid waste a

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(1) Monsieur Alfred Julia - corresponding member of the Abbeville Society (Visit of French Archaeological Society in 1893).

## Underground City of Naours (Cont'd)

township of Austrasie, they were scarcely seen again until the last years of Charlemagne when they threatened various areas of his vast empire. In the reign of his son, Louis the Easy Going, their ravages increased which lasted up to the first year of the 10th Century.

In 842 the coasts of Picardy were laid to waste by these pirates. In 859 they took Noyon and Amiens. In 883 they ravaged Picardy again, and siezed Amiens once more. In the year 925, the Normans were established in Neustrie, and returned to lay waste the territory, where at last they were beaten.

After the Normans, the region was devastated by the wars of the 'majeurs' of Naours, or more strictly their rebellion against the Abbot of Corbie, their lord of the manor and count.

Founded in the 7th Century by Queen Bathilde and her son, Clotaire III, the Abbey of Corbie whose importance was rapidly developing, included the Naours commune (parish) in the manor. The abbots of Corbie, in order to administer their part of their property, longed to establish at Naours the function of mateur. It is believed that these administrators were only subjected to superficial control, for the mateurs of Naours grew rich rapidly, yet at the same time through their position, managed to gain control over those under their jurisdiction.

In the reign of Louis IX, one of them became particularly powerful, and plotted with his chief officials to make themselves independent of their lord, to whom they vehemently refused allegiance. The plot was hatched, it succeeded in all respects and the mateur immediately assumed the title of Lord of Naours. He commenced by terrorising the countryside by burning and killing, at the same time he seized the fortified castle from where he defied the militia which the Abbot of Corbie raised against him. This state of war lasted several years. It only ceased when Louis IXth issued an edict in which he called upon the mateurs of Naours, the lords of Wargnies, to lay down their arms and surrender to their overlord (suzerain), the Abbot of Corbie.

Afterwards, there were the wars of Philippe the Fair, which led to the alliance with John of Bailleul against the King of England, Edward I, and against the Flemish which stretched over the period between 1294 and 1305.

On the 21st August 1337, Edward III King of England declared war against Philippe VI of Valois, took up arms and the title of King of France, and began that terrible struggle which was to last more than 100 years. Edward invaded Picardy, which before long, he was compelled to give up.

At Crécy (borough of Picardy), a fierce encounter took place with the English on 26th August 1346, ending in disaster for France.

In May 1359, the territory underwent a new invasion by the English. In 1369 it was devastated by the Duke of Lancaster, then in 1387 by English soldiers of fortune. Afterwards, it submitted to the sojourn of the 'Ecorcheurs' (fleecers). The problem then was that large numbers of strong bands of adventurers and robbers perpetrated the most appalling havoc in France from 1435. They seized the Castle of Naours which they occupied for some time after having deposited their booty there.

The inhabitants during this time were living hidden in their caves. Captains like La Hire and Blanchefort could be seen at the head of these bands, who had powerfully aided Charles VII to reconquer his Kingdom.

In the reign of Louis XI, in 1472, the Duke of Burgundy who had signed a



## Underground City of Naours (Cont'd)

truce the year previously at Amiens, ravaged the region, took Roye, and devoted himself to the sacking of Nesle. In 1475, King Louis XI, who had concluded an alliance with the Emperor Frederic II and the constituents of the dominion, achieved brilliant success against the Duke of Normandy in Picardy.

Under Henry II (1553) after they had seized Théroouanne, and they had razed Hesdin to the ground, the Imperials who over-ran this region sustained defeat near Doullens.

In the year 1554 Picardy was laid to waste by the Duke of Savoy. In 1557 again by the Spaniards, this time Ham and St. Quentin were seized.

The years 1576 to 1590 marked the era in which acts of war against religion and the confederacy (the 'League') took place in the territory. The Huguenots whose assembly spots were quite near to Naours at Wargnies and at Havernas made several raids there.

1595 marked the date of occupation of our soil by the Spaniards who took and pillaged Doullens. In 1597 the town of Amiens succumbed in turn.

On 3rd July 1636, the Imperials entered Picardy seized La Chapelle (9 July), Catelet and Corbie which they devastated (August 15).

The ruffians of Prince Thomas, Commander in Chief of the Spanish armies, indulged in the pillage of Naours which they partially destroyed.

In 1640 there was a fresh incursion of gangs. The result was the siege and capture of Arras. (2)

Then came the wars of Louis XIV, during which the souterrains were again frequented, chiefly in 1709, at the time of the English incursion.

In the following reigns there was no more war in Picardy consequently, the refuges remained unoccupied. They were visited however, towards 1750 during Louis XV's time, by salt smugglers who set up a store there, the location of which was rediscovered by Abbé Danicourt.

The souterrains were not occupied again until the time of the very hard winters, then by the families of spinners who gathered together to spin the wool. c.1800 the principal entrance gradually became blocked. From 1830 they lay dormant.

What would the life of our ancestors have been like in these refuges? It is not possible to state precisely what it was like, nevertheless, we can determine from researches some information.

The installation of the population in the refuges was carried out with a view to long duration on each occasion. It was a matter of once the approach of the enemy was signalled, to abandon momentarily the spot which offered no protection to the inhabitants against the extortions of the war folk from whatever band they might have belonged but equally feared. The inhabitants, consequently, withdrew into their refuges taking with them their cattle and agricultural instruments which constituted among a number of them, their most valuable possession.

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(2) Between 1635 and 1640 i.e. in the middle of the Thirty Years War, the inhabitants of the country between Amiens, Doullens and Arras fleeing before the gangs of John of Weerdt, took refuge in the numerous crypts and this is the era when the immense caves of Naours were most frequently in use.

## Underground City of Naours (Cont'd)

With each invasion a new life was set up in the bowels of the earth. The various families bunched together in rooms, in quarters alongside the galleries in orderly cells arranged symmetrically, and at the entrance of which can still be seen today the embedded slots of the doors with notches for the tenons; the cattle sheds with hewn stone boundary posts, feeding troughs and rings set deep in the stone. Some well preserved chambers still contain hewn out recesses for bunks and cupboards.

In point of fact, the particular intended purpose of only three chambers, that are spacious, parallel and inter-communicating, can be recognised with certainty; these are the three naves and a chapel capable of holding 400 persons: at the bottom of each of them is an archway acting as an altar recess, in the words of the archaeologists, an 'arcosolium', such as those in the catacombs of Rome.

In the walls can be seen hundreds of cavities showing evidence of soot where small lamps of baked clay (terra cotta) were placed, "les crechets", of which a great number have been collected either of iron or of clay.

Symbols and inscriptions are everywhere, monograms of Christ and the Virgin, coats of arms, simple crosses, Saint Andrew's cross, Malta Cross, names of places, of families and a great number of dates, spaced out from the year 1340 to 1792.

At certain spots in the underground city, at the point of link up of various streets, there opens out immense areas, which formerly were used as assembly places. Thus we have the Congress Hall, the Dome, the Ancestral Place, and the Rotunda. (3)

A quite remarkable feature is the existence of enormous chimneys, shafts having a base measurement in excess of 1 m. These smoke ducts went through the hill, which according to the particular situation, varied from 23 - 31 m. thick. Originally, these chimneys, six in number, positioned in the various parts of the souterrain emerged at ground level in the fields or copses. It is probable that the smoke drew the attention of the enemy who therefore employed various means to penetrate the structures to find the refugees. The latter realising then the danger that they were running employed the following strategy.

The upper part of each chimney was filled-in to a depth of 7 - 8 m. from the exterior outcrop. At some distance from there, at 20 - 30 m., a hole of similar depth was dug. Then the upper part of the truncated chimney was joined up to the new holes by a horizontal gallery. The smoke went up this new passage before blowing itself out far from the now perfectly well concealed aperture. For still more safety, two of these smoke ducts were directed towards the cottages of two millers located on the hill, where they let the burnt gasses escape by the appropriate chimneys of the cottages. This ruse succeeded marvellously. In addition, a wholesome supply of fresh air in the underground city was the happy outcome of the huge draught developed by the hearths.

The Abbé Danicourt discovered quite a large quantity of objects in the souterrains. This fact, if there was need for it, confirmed the idea that they were frequented, sometimes for quite long periods and it enabled us to be able to specify the period. There was discovered in particular, a

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- (3) It is important to state that the Abbé Danicourt gave village street names to certain galleries; other names draw their inspiration from local history or from several personalities to whom crossroads and chambers were dedicated in tribute to the interest they showed in the work of excavation.

## Underground City of Naours (Cont'd)

considerable quantity of sherds, various implements, hammers, pedal cranked pulley wheels (winches), foot warmers, sickles, knives, scissors, spurs, fragments of weapons, musket and arquebus mechanisms, lamps, as mentioned before, some in baked clay (terra cotta) others in iron. Also found were implements for shoeing horses, donkeys and mules, as well as bone remains of all species. These various objects were collected throughout the souterrain in the thick bed of humus which had covered up the floor.

Numerous coins were also found embedded deeply at varying depths according to the period in which they originated. Initially, coins with the head of Louis XIV dating from 1709, the last occupation by the refugees, at the time of the passage of the English through the region. Then, Louis XIII coins (30 Years War). Then deeper and deeper in deposits were discovered coins with the head of Henry IV and Henry II; next to those of Francis I (1515-1547), Louis XII (1498-1515) and Philip the Good (1419-1467; Charles VI (1380-1422) and Philip the Fair (1285-1314). Certain coins are gold, others silver and the rest in bronze or brass.

Then again, in 1905, the Abbé Danicourt recounts the lucky find which was recognized as a treasure trove.

"It is a genuine treasure composed of 20 remarkable gold coins discovered in the most commonly used passage of the underground town, whilst endeavouring to establish the connection between the Rotunda and the principal entrance, which will henceforth bear the name Treasure Gallery."

"It would not be appropriate to list the most valuable coins, almost all of them gold, without speaking of the spurs, and a quantity of objects of less value, but offering a genuine interest from the archaeological point of view.

1. Two Karolus - Charles VI and VII - very beautiful.
2. A Louis XII crowned with a porcupine.
3. Four Francis I superb crowns of the sovereign.
4. Two Spanish Ducats of Phillip II, approximate date 1685.
5. Two Henry IV ones in bronze of 1592.
6. Four Louis XIII, 1615, 1635, 1640, 1642. Those of 1642 carry the head of the King, crowned with laurels. It is floral edged.
7. Two magnificent coins of the infant (period) of Louis XIV. They are dated 1647. The head of the royal child is charming, the forehead is crowned with laurels, a lock of hair hangs down to the neck, it is the gem of the collection."

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In neither of the last two wars were the grottos used for their age old intended use as shelter for the population of the villages and surroundings. But the Army, on the other hand, made extensive use of them.

From 1916 - 1918 detachments of English and Canadians stayed there, the amount of graffiti on the walls witness to that fact. During the Second World War, the General Staffs further appreciated the strategic benefit of this vast underground network. From 1939 British troops made partial use of the halls to store supplies, particularly motor fuel.

In 1941, it was the turn of the Germans. An Artillery Unit transformed the caves into a munitions depot. A little later in 1943, Naours was to become an important base for the Army of Occupation.

Out of this favourable unobtrusive spot, unsuspecting to the aerial observer, and out of those galleries protected naturally by 20 - 30 m. of earth, the

German High Command decided to make it the master piece of their defensive underground structure, in conjunction with the famous Atlantic Wall. Great conversion work was then undertaken, especially in the most spectacular part of the caverns, the chapels. Powerful generating sets were installed. Strengthened, bricked up, ventilated and illuminated, the galleries were fitted out as common rooms and individual shelters equipped with plant similar to that in submarines. The exact role of this base evidently remained secret. It was spoken of as a wave-jamming station, as a Command post, securing for the hinterland the control of the small coastal forts. What is certain is that Rommel kept a close watch on these installations. It is said that Hitler came in person to inspect them.

At the Liberation, the first French people who entered the souterrain only found what the soldiers had been obliged to leave behind; masonry work and war material. In the euphoria of the moment these souvenirs of gloomy days were ransacked.

There remains here and there several traces. But that which the visitor can no longer admire is the beautiful collection patiently gathered together by the Abbé Danicourt. This disappeared with the last occupants.

Since Whit 1949, the date of the re-opening, NAOURS-LA-SOUTERRAINE again welcomes groups of tourists, well informed enthusiasts and ordinary spectators. To the former, it offers the impressive spectacle of the gigantic skilful and rugged work of man; to the latter it implies, that one day perhaps, following further enquiries, the task of finding the key to its riddles will be undertaken.

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DIARY DATES

- 11th - 14th May, 1982 - Fortress Study Group visit to Naarden, Holland. Possible day's visit to Antwerp to visit forts. Contact: Dennis W. Quarmbly, 18 Watergate Road, Newport, Isle of Wight PO30 1XN. (SAE)
- 25th - 27th June, 1982 - Subterranea Britannica Nottingham Study Weekend. Visits to include the Nottingham caves - Peel Street, Nottingham Castle, 19th Century ice-house; 8 Castle Gate - 13th Century malting cave; Goose Gate - brewery caves c. 1800; Gotham mine; Good Luck lead mine and Matlock Lead Mining Museum. Contact: Miss M. Mahony, 3 Littlegreen Road, Woodthorpe, Nottingham. (SAE)
- 9th - 13th July, 1982 - S.F.E.S. International Symposium at Auneau, nr. Chartres, France. Contact: Mrs. S. P. Beamon, 16 Honeyway, Royston, Herts. SG8 7ES. (SAE)
- 20th - 28th August, 1982 - Whernside Manor/NAMHO Mining Course. Lectures and visits to surface and underground sites. Cost £80 including accommodation etc. Book by 30th June. Contact: J. D. Carlisle, 2 Florence Terrace, Rosedale East, Pickering, N. Yorks. (SAE)

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Michael JACK : Life Among the Dead : Cortney Publications, 95 - 115 Windmill Road, Luton, Beds., 1981 : £2.50. (post free). Foreward by The Rt. Rev. The Lord Coggan, D.D., Archbishop of Canterbury, 1974 - 1979.

At the end of the Year of the Disabled it is a pleasure to advise members of the book written by Michael Jack who describes how he has coped with deafness since birth. There are digressions which reflect the author's varied interests of music, photography, local history and underground exploration etc.

THE UNDERGROUND STONE QUARRIES at CAEN,  
LOWER NORMANDY, FRANCE : PART 'I

Paul W. Sowan

UNDERGROUND STONE QUARRYING IN ENGLAND

Underground quarrying of cut or dimension-stone for building in England, thought to have been introduced from France at about the time of the Conquest, is now an almost wholly defunct art. Although it is suspected that the working of ashlar and freestone underground may well have originated in classical Greek and Roman times, almost nothing is recorded of underground quarrying of squared stone from those days (Davies, 1935; Healy, 1978.) Nevertheless, it seems probable, for example, that the famous Catacombs of Rome (Pearman, 1981; Noël, 1965) had their origins in ancient underground building-stone quarries.

Only in Wiltshire, as at Monks Park underground quarry at Corsham visited by Subterranea Britannica during the summer Study Weekend of 1980, is the working of building-stone underground still carried on (Perkins, Brooks & Pearce, 1979), although there are currently plans for the Cathedral at Salisbury (R. O. C. Spring, pers. comm.) to re-work a part of the underground stone-quarries at Chilmark near Tisbury in that county in 1982.

Some account of the building-stone quarrying in Britain (in decline for years past, even from openworks) has been provided by Ashurst & Dimes (1977), Bezzant (1980) and Byrne (1981); and a directory of quarries and firms is published by Stone Industries (1980.) It seems that, after years of decline, there is now an upturn in demand for natural stone (mainly, nowadays, in the form of 'cladding' or for 'feature' fireplaces!) in building. A distinction is drawn between underground building-stone quarries sensu stricto, and what are best described as mines, sensu stricto, for chalk, limestone, sand and other miscellaneous non-carboniferous, non-metalliferous mineral products - a distinction not made sufficiently clearly by many authors, including Down (1978.)

In England, many ancient quarrying sites are well-known, a number of them subterranean. Whereas quarries at Barnack, Maidstone, Quarr, &c, appear always to have been openworks, those at Bath/Box/Corsham (Avon & Wiltshire)(Perkins, Brooks & Pearce, 1979, et al.), Beer (Devon)(Oldham, Oldham & Smart, 1978), Chaldon/Merstham (Surrey)(Sowan, 1976), Chilmark (Wiltshire)(Barron, 1976; Ord & Reader, 1912), Purbeck (Dorset)(Poole FoE, 1975), Totternhoe (Bedfordshire)(Kemp, 1973-75) and Windrush Valley (Oxfordshire)(Arkell, 1947) were partially or wholly subterranean. Chaldon/Merstham, and Chilmark, are of special interest in having been of major importance for great works well beyond their immediate districts in Medieval times; and they share inconvenient inland locations with no immediate access to easy water transport.

QUARRIES IN FRANCE

In France, by contrast, the quarrying of stone, frequently underground, has long been a flourishing business. Stone Industries' directory (1980) bears witness to this, carrying advertising material relating to Rocamat's U.K. agents, the Cathedral Works Organisation of Chichester, suppliers of almost a score of varieties of construction, paving and cladding stones from French quarries. Wiltshire (1980) has described the use of French stone in current building conservation works in England.

Noël's (1970) directory of French dimension-stone quarries lists four score or more quarries, many of them still in use, and many of them partially or wholly subterranean. For each quarry so located there are helpful location maps, historical notes, photographs, and architectural and technical information on the stones worked. Quarries are described from almost every Département, and from a very wide range of rocks (though mostly limestones) from pre-Cambrien to

Kainozoic. In an earlier book (Noël, 1965) much information is given on French stone quarries and extraction and architectural techniques.

## THE QUARRIES AT CAEN

### Geological & Geographical Setting

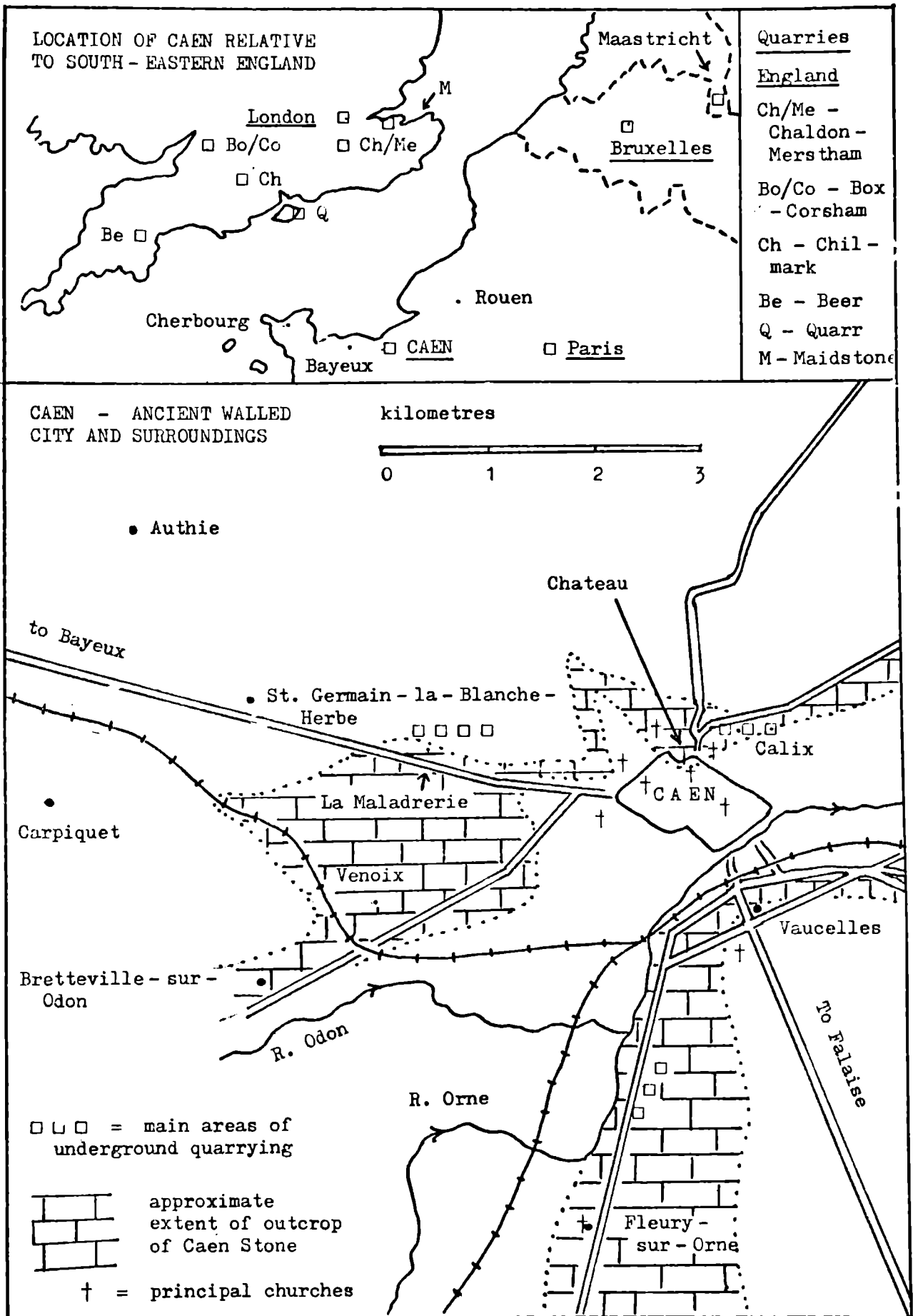
Renn (1973) informs us that 'Water transport was cheaper than cartage and much Norman work in south-east England is in Caen stone, a cream limestone imported from Normandy.' Throughout the Middle Ages, building accounts for England's most important monuments (many of them reported by Colvin (1963 onwards) in the History of the King's Works) bear witness to the importing on a large scale of stone from Caen in the modern Calvados Departement of Lower Normandy. The modern city at Caen stands on either side of the river Orne, some 17 km. inland from the Manche (English Channel) between Le Havre and Cherbourg, at Ouistreham.

A minor left-bank tributary, the Odon, enters near the city centre, and in fact the original development appears to have been on the Ile St. Jean, a river gravel-flats island formed at the confluence. The neighbouring hills on the left bank of the river rise, from an abandoned river cliff line, from a point some 800 m. or so back from the main river course - the Ile St. Jean and old town centre intervening. On the opposite bank, immediately beyond the main railway line and station as now are, the ground rises steeply from the river Orne, within about 200 m., in the suburb Vaucelles. Ancient Caen thus had its nucleus and early suburbs on the Ile St. Jean and adjacent hill slopes on the right bank of the Orne and the left banks of the Orne and Odon. These hills, rising to c. 70 m. above sea level, from about 20 m., are almost entirely, in this district, of Jurassic limestones of geological age comparable with that of the building-stones of Bath and district in Avon and Wiltshire, the Oolithe blanche (Bajocien) being overlain by the Calcaire de Caen (Vesulien.) It is the Calcaire de Caen formation, some 40 m. thick, which yields the Pierre de Caen, or Caen stone - in beds up to 5 m. thick within the central part of the 40 m. formation. The regional dip of the formation is of the order of  $\frac{1}{2}^{\circ}$  towards the north-east. The strike of the beds carries the formation southwards alongside the right bank of the Orne through the villages of Fleury-sur-Orne, St. Martin-de-Fontenay, etc, where stone was also quarried for local use. Eastwards, younger, including Cretaceous, rocks outcrop towards Rouen. Towards Bayeux, in the west, the Calcaire de Caen passes diachronously into the equivalent argillaceous facies of the Argile de Port en Bessin and immediately past Bayeux the Jurassic beds yield to underlying older rocks at surface including the Carboniferous of the Le Molay-Littry coalfield and the Palaeozoic and older rocks of the Cherbourg peninsula and Brittany.

### Early Quarrying

The stone has been found used (Noël, 1970) in Merovingian coffins (5 C) found in the district. Excavations have yielded evidence for a Gallo-Roman township in the Abbaye-aux-Hommes area - perhaps Catomagos (L. Cadomum), whence Caen? It seems that what town there was was abandoned about the end of the 3 C, 'probably the result of a barbarian invasion.' Later, a village seems to have been re-established on the rising ground on the left bank above the Odon where the former church of St. Martin stood, some 700 m. to the west of the castle, where vestiges of a church and burial ground of the 7 C have been discovered at the bottom of the Rue de l'Academie. Early working of the stone certainly occurred at and for the castle (Chateau de Caen) erected by Guillaume le Conquerant (William the Conqueror, 1027-1060. Excavations at the chateau (de Bouard, 1979) revealed an open stone quarry probably from the 11 C, below the floor of the 14 C building in the north-eastern part of the keep courtyard. The chateau occupies a bluff of the Calcaire de Caen, overlooking the lower Ile St. Jean and whatever town there was at this period.

Underground Stone Quarries at Caen (Cont'd)



Much of the stone, either for the earliest castle or for the extensive 14-15 C ramparts which now make up the bulk of the visible remains, evidently came from the open dry moat or fosse which surrounds it on three sides and which, too, in communication with it on the east and west isolated the donjon in the northern part of the ground enclosed within the ramparts. Guillaume built, also, the magnificent churches dedicated to St. Etienne (Abbaye-aux-Hommes) and to La Trinite (Abbaye-aux-Dames.) There were also lesser churches of the Norman period, including St. Nicolas. Thus by at least this date, there was a large home demand for building stone.

The city developed subsequently as a walled city, and numerous Norman and Medieval churches were erected, including St. Michel de Vaucelles (12-16 C), St. Pierre (13-16 C), St. Jean (14-16 C), St. Sauveur (15-18 C) and others - some within the walls, others without. The city walls extended from the chateau in a south-westerly direction alongside the Fosses St. Julien (whence stone was taken, leaving a dry moat alongside the outside) almost to St. Etienne, then south-easterly to the river, returning north-easterly along the bank and north-west back to the chateau near St. Pierre, so enclosing the Ile St. Jean. The Odon formerly flowed through the walled city between the chateau and St. Pierre, and there is still a navigable Bassin St. Pierre outside the north-eastern walls alignment where the Canal de Caen now provides a more convenient navigable waterway to the sea from Caen's industrial zone than the many-bridged Orne.

Doubtless the vernacular architecture of earlier centuries was largely of timber (some houses of the 15 and 16 C survive), although in more recent times much stone was used for building of all descriptions. Thus there is no doubt that stone was worked on a vast scale, from the 11 C onwards, both for use in Caen and for export to England. It seems more than probable that proximity to the city centre, and to the former and existing waterways near the chateau and St. Pierre and below La Trinitie, points to the quarries under St. Gilles (east of the chateau) and at Calix (on the left bank of the Orne, immediately downstream of the city) being the original points of underground extraction, with perhaps additional and partially underground workings known or suspected at St. Julien, St. Nicolas (on the left bank) and St. Michel de Vaucelles (on the right.) Certainly the known and still accessible underground quarries at Calix are though locally, from their relatively restricted headroom and state of collapse (R. Matthias, pers. comm.) to be the oldest. Photographs of the Chaldon and Merstham quarries (in Surrey) elicited the response 'just like Calix.'

Many street names in the suburbs of Caen bear witness to the extension of underground quarrying well away from the city centre in later centuries. Thus, starting at Vaucelles and going clockwise, we find the Rue de Puits de Jacob, Rue des Carrieres de Vaucelles, Chemin des Carrieres at Fleury-sur-Orne, Chemins des Carrieres at Bretteville-sur-Odon and at Carpiquet, Venelle du Puit at La Maladrerie, Rue de Tailleurs de Pierre at St. German-la-Blanche-Herbe (near the ancient Abbaye d'Ardennes, off the road to Bayeux), another of the same name at Authie, Rue des Carrieres St. Julien north-west of the chateau (apparently a complex of large open quarries, not known to extend below the university campus to its east), Rue du Puits Picard at St. Jean-Eudes, Rue des Carrieres at Herouville-St. Clair, and the Chemin des Carrieres at Colombelles.

All the accessible quarries, and those known from documentary and geophysical researches to date, have been plotted as far as possible, and often in considerable detail, on three plans at 1:1,000 by the Service des Carrieres of the City of Caen's Direction Generale des Services Techniques. These plans shew open quarry sites; underground quarries explored and surveyed, or explored but not yet surveyed; and 'zones of uncertainty.'

As is usual also in England, more or less continuous quarrying from early times to the 20 C makes it a difficult task to distinguish modern from 15/16 C and Medieval working. Historical records have a part to play here in helping



to identify, and perhaps eliminate, the more recent excavations.

### Styles of Underground Quarrying at Caen

Noel (1965) recognises that underground quarrying generally developed from hill-flank drift entrances from open quarries, and often subsequently led to workings via plateau-top winding shafts, or slope-shafts. He further recognises two principal underground extraction methods - 'extraction par hagues et bourrages' (dry-stone-walls enclosing rubble-filling packs, floor-to-ceiling), and 'extraction par piliers tournes' ('pillar-and-stall'.) Accessible quarries at Caen do not fit neatly into this classification.

The earliest quarries seem to have been openworks excavated from river-bank level into the rising ground of the Caen stone outcrop, up and down-stream of the chateau, and at Vaucelles. Such a plan of working was obviously convenient for extraction on the level, and for shipping out stone. Although I have found no clear evidence within the city, it appears reasonable to assume that at Calix, where the stone outcrops just above flood-plain level, drift entrances were after a while driven into the hill slope from the early open quarries' floors.

The slight inclination of the stone bed stratum, however, carries the outcrop to higher levels to the west and south of the city, thus necessitating alternative extraction techniques. At Fleury-sur-Orne, south of the city and on the right bank of the river, sloping quarry trackways were made along the steep river bank (here 20 m. or more high), passing numerous drift entrances high up above water level. Stone extracted from these drifts was presumably carted (via the Chemin des Carrieres and the Chemin des Coteaux) to river level at Vaucelles. Throughout much of the higher ground north and west of the city, however, the quarry entrances were vertical shafts from the plateau surface, penetrating some 8-10 m. of worthless limestone overburden and overlying drift before reaching the stone bed sought. As detailed below, these numerous shaft-served quarries display very distinctive features which answer to neither of Noël's extraction methods. Three quite different styles of underground working were examined in some detail in the summer of 1980, and are described below. Rioult (no) has described open quarries and quarrying methods at two further locations alongside the Caen-Bayeux-Cherbourg railway line between Bretteville-sur-Odon, Venoix, and Carpiquet.

### Allemagne / Fleury-sur-Orne

Older literature refers to the Carrieres d'Allemagne, this being the original name of the village - in 1917 it took its present name in memory of Fleury-sous-Douaumont, which was totally destroyed during the battle of Verdun. Extraction was at first from drift galleries driven in from access roads high up on the banks overlooking the Orne ...

'as was the practice at Paris and at St. Maximin, and the workings ultimately extended under an area of more than 20 hectares, exploiting a bed of stone 10 m. thick, under an overburden of 15 m. of calcareous stone usable only for making lime. Quarrying was latterly from galleries 6 m. high, separated from each other by 3 m. square pillars ...

'After the liberation [of 1944] pre-cut stones of standard dimensions in common use - 50 x 23 x 22 cm, 40 x 23 x 22 cm, 35 x 23 x 22 cm, and 22 x 23 x 22 cm - being worked. Other dimensions were supplied on demand. Exploitation ceased in 1952, because of fissuring encountered which made the economic extraction of sound stones of the required sizes difficult, and increasing problems with springs' (Noël, 1970.)

These older (river-bank) and newer (sub-plateau) quarries, it seems, may already have existed by 1848, for Donaldson refers to four square miles of workings (a great deal more than 20 hectares!) at Allemagne ...

'Some are worked by means of shafts, which afford access to the quarries underground, branching off on all sides in long galleries, or multiplied by chambers, which are about 18 feet wide, and the ceiling-bed upheld by massive rude piers, which are left 9 feet square and 18 feet apart, the height being about 15 or 20 feet. These quarries, which are immediately on the bank of the river - here abruptly rising from the water - have an access from the side of the bank, and are approached by inclined roads, leading from the summit of the bank above and from the water's edge below. The openings to these dark and gloomy caverns have a very picturesque effect, and a continued series of them present themselves one after the other. The galleries penetrate to a considerable distance. The extraction of the stone is done by contract or task work, at so much per cube, the quarrymen removing the blocks and dressing them, and another set of men contracting for their carriage from the part where they are quarried in the quarry to the quay at Caen.'

Details of the several stone beds are then given (as also by Noël, 1970) ...

'The whole of the stone of these beds [Donaldson continues] is soft and tender in the quarries, and the blocks are extracted with great ease. They are produced of regular size and squareness. When taken to the outside, and exposed to the atmosphere, they gradually part with much of their humidity, and harden; and, if exposed on the quays during winter, they are covered over to protect them from the frost. They saw freely with a common peg-toothed saw, without either sand or water ... they produce very sharp arrises. and receive a very smooth surface on the face. During the winter little work is done in the quarries in regard to extracting blocks of stone; but the men occupy themselves in sawing and squaring slabs about 12 or 15 inches square, and from an inch to an inch and a half, or more, thick, which are used for paving halls, galleries, and even some rooms inside their buildings ...'

Donaldson continues to claim that Caen stone could safely be placed in a building any way up, unless white veins were perceptible in it - an observation which attracted the editorial comment 'We strongly dissent from this opinion!' - and that 'tradition' had it that the ancient buildings of Caen were from the Allemagne quarries - 'the appearance of the stone [in the Eglise St. Pierre, 13-16 C] justifies the tradition of its origin, and I know not how to question it.'

W. & J. Freeman (1848), however, shippers of Caen stone from the Allemagne quarries, inform us that in their opinion 'With reference to the quarries at Allemagne, it does not appear that they were worked to any extent until about the year 1808 ... a stone called colombelle [Colombelles is a village on the right bank of the Orne, downstream of the city] was formerly shipped in considerable quantities ...'

The 'carrieres de Fleury', in June 1944, are claimed (Duncombe, nd) to have offered shelter from the liberation bombardments for more than 15,000 persons. Nearby, on the Fleury commune boundary, was the carriere Pochiet, whence pre-cut stone was obtained for use in post-war reconstruction, and where activity ceased in 1958. And, immediately to the south of the village, on the west of the RN 162, the carriere carrelettes, an open quarry, yielded 'moellon' or small pieces of ashlar (Noël, 1970.)

Details of features noted underground in two areas of underground quarry in the summer of 1980, at Fleury, are now presented.

TO BE CONCLUDED

Dorothee Kleinmann and Sylvia P. Beamon.

Villeneuve-sur-Lot, of old Aquitaine, situated in the south west of France was the venue of the XIth International Symposium. As you approached the area by roads crossing the highland and looked across the countryside with its hills and valleys, the slopes of the soft chalklands became visible which would indicate that there may be souterrains, and of course, there are in fact a great number known.

A room in the Cultural Municipal Centre had been put at the disposal of S.F.E.S. In the foyer was an exhibition of photographs and finds from underground excavations. M. Jean-Francois Garnier, an assistant of the Municipality and an active member of the Society had prepared the programme together with the President M. Serge Avrilleau.

The President welcomed all the delegates and the communications began:

Herr Karl Schwarzfischer: The excavations of Pfaffenschlag (Czechoslovakia) which have been made on a scientific basis, are of great importance for the research of the Erdställe (souterrains). They prove that even in the last third of the 13th Century Erdställe were being constructed. Apparently, they were built at the same time as the village. Vladimir Nekuda, who has conducted the excavations, does not believe in the theory of refuge for these souterrains as the entrances were not concealed. He thinks they could have served as storerooms for objects of vital importance in the case of fire. But the very few objects which have been found in these souterrains contradict this theory. Pfaffenschlag was destroyed by fire !

Mrs. Sylvia P. Beamon showed slides of the investigation of Anstey Castle Mound by members of Subterranea Britannica and, together with Beatrice Broens interpreting, explained the difficulties they were encountering in trying to rediscover a pair of iron gates below the surface of the water in the moat, but against the mound. An internal working within a castle mound was known from Reigate, Surrey and in France, a similar structure exists at La Motte de Monsavignac. Both the castles in England were built by the Normans.

Mrs. Sylvia P. Beamon also showed slides of the Eastry, Kent chalk workings, as an example of the subsequent use of underground structures, since they were originally mined for chalk, then used for smuggling activities, altered to a 'folly', dubious parties held there, and more recently, used as a rifle range.

M. Serge Gady lectured on the results of his research in the region of the Gartempe river. The souterrain Trou aux Fées (Haute Vienne) was his example to explain his excavation method in attempting to understand the construction plan and the use for which people excavated the souterrain. It is most important to study the stratification. There are always two areas, he has called them the static zone, where people sat, slept and ate, and the dynamic zone where people moved around. Sometimes there are traces that do not fit the distribution in either a static zone or a dynamic zone and it is obvious that the souterrain was used later by other people for another purpose. The distribution of the furniture is important too, it helps to understand its utilisation. M. Gady showed, not only slides, but many statistical tables and plans in order to explain that a souterrain is always a monument integrated with its surrounding territory. In the Gartempe region he has found that the souterrains are in close proximity to the church or chapel, the well and the cemetery, and all are situated in an area of 150 m. radius.

Mrs. Dorothee Kleinmann spoke on a suggested card index, by which every type of souterrain with its different characteristics could be classified in a very simple manner. A Committee would have to decide about the type of cards to be adopted, after which all members of S.F.E.S. would be asked to fill in one

card for every souterrain in their region. This card-index would assist with the study of typology.

Mrs. Kleinmann further discussed the new archaeological field research, the principles of which, could be useful in the study of the relation of a souterrain to other monuments in its territory.

M. Camuset also spoke on the typology of souterrains, then together with Abbé P. Mollent, he presented the research done at Cortrat where the souterrain is in association with the church. The old gallo-roman roads crossed each other near the site of Cortrat and it is noted that here also, there is a possible connection of the souterrain with these roads, the church and the cemetery.

Several other papers followed read by members of the Société Archéologues de Lot-et-Garonne. Their subject was the Middle-Ages of the Département Lot-et-Garonne and they showed slides of finds and excavations. The region is rich in pits found in the fields, in souterrains, even in church and in some houses.

M. Lionel Chassérieu discussed a series of such pits excavated in the ground under a castle, filled with several layers of earth, bricks, pottery and bones, which are associated with coffins. He thinks that these pits were not for storage but ritual ones.

M. Boscaud read a document of the 18th Century which relates to the construction of a souterrain. Very few documents exist concerning these structures and it is of the highest interest to find such an account.

M. J.-F. Garnier showed slides of other ovoid pits excavated in the region.

Mme. Christine Gady gave a most instructive paper on the thermoluminescence method of dating finds. She is a physicist at the University Laboratory at Bordeaux and thinks this scientific method could be helpful in dating souterrains.

The delegates visited many souterrains including, Fontirou, La Croix Blanche, Vitrac, Casseneuil, Monclar, Brugrac, Le Temple sur Lot, Le Laussou, Devillac, Tourliac and Ferrensac.

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#### SUBTERRANEAN KINGDOM : THE AUTHOR REPLIES

We have received a communication from Nigel Pennick protesting at the review of his book The Subterranean Kingdom in Bulletin 14. He says, inter alia, that 'Your painstaking scholarship over the supposed 'sources' of my material (many of the Bulletin articles you list were of 'secondary' material referring to earlier publications), strangely omits to mention the numerous topics which have never appeared in your periodical, which actually take up over 95% of The Subterranean Kingdom... Your seemingly interminable list of articles (which must have taken up space in the Bulletin that could have been devoted to something more useful) deals in fact with only 12 topics, some of which merit fewer than 5 lines in my book.'

Mr. Pennick lists a great many topics dealt with in his work which have never been noticed in our Bulletin, and to point out that any attempt at a full detailed bibliography of sources would have been extensive for such a wide-ranging survey, an unjustified expense and out of the character in the work. He makes some valid points, although the fact remains that a number of authors and illustrators for our Bulletin have felt aggrieved at not being approached about reproduction, or acknowledged in the book.

P.W.S.

BOOK REVIEWS:

Norman BEZZANT : Out of the Rock

London : Heinemann, 1980 (ISBN 0 434 06900 0). xii + 244 pp, illus. £10.50.

Described as 'the first of two volumes, published in association with the Bath and Portland Group,' this attempt at an overall history of stone working by the Group (around Bath, on Portland, and in North Wales etc) has been written, with much expert assistance, by a professional journalist whose previous books have included (with co-authors) The New Wine Companion, Cruiser Sailing Handbook and Help! - for Everyday Emergencies.

The list of acknowledgements makes it clear, however, that the author has done his homework, and consulted the right people. There are chapters dealing with the early history of the stone working, and necessarily, on archaeological and architectural aspects. The impact of canal and railway developments is considered. The commercial history of the firms, which in due course became the Bath & Portland Group, is traced. The firm's interests and operations in North Wales are chronicled. Chapter 13 is specifically about Portland and its quarries; and Chapter 14, pages 142 - 153, 'Man into Stone', is devoted to a description of the underground quarries around Bath, Corsham and Bradford on Avon. The story is brought right up to date with some account of the wartime secondary re-use of some of the underground quarries; the importance of the War Graves Commission as customers for stone (Hopton Wood and Portland); and the modern use of stone slabs for cladding and ornament.

Not a study of mining or quarrying as such, the book is nevertheless valuable in presenting the broad context within which the stone quarries operated. Even now, too much mining, as also railway, history is too narrow and unrelated to general geographical, commercial, historical and technological context.

P.W.S.

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D. A. BAYLISS : Retracing the First Public Railway

Croydon : Living History Publications, 294 High Street, Croydon CRO 1NG  
80 pp., illus. £1.70. (postage and packing extra).

Participants in our East Surrey Study Weekend will recall that the southern terminus of the Croydon, Merstham and Godstone Railway (in effect an extension of the Surrey Iron Railway, the first public railway in the world) in 1805 was in fact, although not intended by the original promoters, at the limeworks and underground stone quarries at Merstham in Surrey. Considerable quantities of stone from the underground stone quarries were sent to London via this early horse-drawn freight-only plateway. This guide is the first serious addition to the general literature dealing with the line for some years. Although industrial archaeological and historical researches into the terminus and its technology are still actively in progress, and further discoveries are likely to be published shortly, the Guide is recommended as a field companion to the still-visible vestiges of this most interesting pre-steam railway.

P.W.S.

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Peter NAYLOR : Discovering Lost Mines

Princes Risborough : Shire Publications Ltd., 1981 (ISBN 0 85263544 3) £1.25.  
63 pp., incl. figures, plans etc.

Devoted mostly to mine sites with visible surface remains, or where safe public access is possible; also mining museums.

